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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/573,051	03/22/2006	Bernard Hendrik Reesink	4872	8981
26323	7590	02/04/2008	EXAMINER	
ROY J DAVIS			SINGH, PREM C	
2425 BOWNESS RD, NW			ART UNIT	
CALGARY, AB T2N-3L8			PAPER NUMBER	
CANADA			1797	
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			02/04/2008	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/573,051	<b>Applicant(s)</b> REESINK ET AL.	
	<b>Examiner</b> Prem C. Singh	<b>Art Unit</b> 1797	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 22 March 2006.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-18, 21 and 22 is/are pending in the application.
- 4a) Of the above claim(s) 14-18, 21 and 22 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-13 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>03/22/2006</u> .  | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

### ***Election/Restrictions***

1. Restriction is required under 35 U.S.C. 121 and 372.

This application contains the following inventions or groups of inventions which are not so linked as to form a single general inventive concept under PCT Rule 13.1.

In accordance with 37 CFR 1.499, applicant is required, in reply to this action, to elect a single invention to which the claims must be restricted.

- I. Claims 1-13, drawn to a desulfurization process, classified in class 208, subclass 213.
- II. Claims 14-18, drawn to a process for making an adsorbent, classified in class 502, subclass 337.
- III. Claims 21 and 22, drawn to an adsorbent, classified in class 502, subclass 406.

The inventions are distinct, each from the other because of the following reasons:

Inventions in Group II and III are related as process of making and product made.

The inventions are distinct if either or both of the following can be shown: (1) that the process as claimed can be used to make another and materially different product or (2) that the product as claimed can be made by another and materially different process (MPEP § 806.05(f)). In the instant case the process as claimed can be used to make a

materially different product, for example, a nickel catalyst with entirely different physico-chemical properties.

Inventions in Group III and I are related as product and process of use. The inventions can be shown to be distinct if either or both of the following can be shown: (1) the process for using the product as claimed can be practiced with another materially different product or (2) the product as claimed can be used in a materially different process of using that product. See MPEP § 806.05(h). In the instant case the claimed desulfurization process can be practiced by a materially different product for example, a cobalt molybdate catalyst.

Inventions in Group I and II are unrelated. Inventions are unrelated if it can be shown that they are not disclosed as capable of use together and they have different designs, modes of operation, and effects (MPEP § 802.01 and § 806.06). In the instant case, a process of desulfurization and a process of making an adsorbent are not related because they have different designs, modes of operation and effects.

The inventions listed as Groups I, II, and III do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons:

The common technical feature of nickel adsorbent is not a special technical feature because it does not make a contribution over prior art. See the rejection below.

During a telephone conversation with Attorney Gregory Turocy on 01/15/2008 a provisional election was made with traverse to prosecute the invention of Group I, claims 1-13. Affirmation of this election must be made by applicant in replying to this Office action.

Claims 14-18 and 21-22 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

***Information Disclosure Statement***

2. Information Disclosure Statement submitted 03/22/200, Foreign Patents: GE 1,144,498 should be corrected to GB 1,144,498.

***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

5. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

6. Claims 1-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Winsor et al (GB 1,144,498) in view of Kimber et al (US Patent 5,059,539).

7. With respect to claim 1, Winsor discloses a process for the removal of thiophenic sulfur compounds from benzene (See page 1, lines 10-13; page 2, lines 9-10, 14-15). The process comprises: contacting the feed stock in presence of hydrogen with sulfided nickel adsorbent (See page 1, lines 23-36, 60-61).

Winsor invention does not specifically disclose that part of nickel is present in metallic form, however, the invention does disclose a partially sulfided nickel contact material (See page 4, lines 7-15) showing high sulfur capacity, prolonged activity (for 1300 hours) and substantially no hydrogenation activity (See page 4, lines 21-27). Obviously, Winsor invention uses a part of nickel in metal form. Thus, it would have been obvious to one skilled in the art at the time the invention made to use part of nickel in the metallic form for high sulfur capacity, prolonged activity, and substantially no hydrogenation activity.

Winsor invention does not specifically disclose rate constant of adsorbent.

Winsor discloses that the supported nickel used in the invention does not show appreciable hydrogenation of the aromatic hydrocarbons (See page 1, lines 50-54). Obviously, supported nickel in the Winsor process has very low value of the rate constant. It is to be noted that rate constant for hydrogenation activity for an adsorbent or catalyst is a property which can be easily determined (as evidenced by Kimber et al, US Patent 5,059,539; column 1, lines 49-68; column 2, lines 1-38), it would have been obvious to one skilled in the art at the time the invention made to modify Winsor invention and determine the tetralin hydrogenation activity for the adsorbent used in the invention. It is expected that the rate constant in Winsor invention will necessarily be in a range as claimed by the Applicant.

8. With respect to claim 2, Winsor invention does not specifically disclose nickel in the metal form, however, the invention does disclose partially sulfided nickel contact

material (See page 4, lines 7-15). Obviously, Winsor invention uses a part of nickel in metal form. Winsor further discloses nickel content from 1 to 50 wt% (expressed as the element) (See page 2, lines 84-87). Thus, it would have been obvious to one skilled in the art at the time the invention made to use a part of nickel, including in a range as claimed, in the metal form for reduced hydrogenation activity of hydrocarbon.

9. With respect to claim 3, Winsor invention discloses atomic S to Ni ratio of at least 0.75 (See page 1, line 78).

10. With respect to claims 4-6, Winsor invention discloses that the supported nickel material used in the present process may be prepared in any of the known ways (See page 2, lines 72-74). Winsor further discloses the details of the process of making nickel adsorbent, indicating that the preferred sulfur compounds are thiophenes (See page 2, lines 84-92; page 3, lines 18- 66; 113-120; page 4, lines 2-6). Thus, it would have been obvious to one skilled in the art at the time the invention made to use the claimed steps because it is expected that the adsorbent produced by Winsor will be structurally and functionally similar to the claimed adsorbent.

11. With respect to claims 7 and 13, Winsor invention discloses hydrogen partial pressure from 0 to 2000 psig (0 to 138 bar) and temperature between 50 and 316°C (See Table: page 2, between lines 59 and 60).



12. With respect to claim 8, Winsor invention discloses benzene as the feedstock (See page 2, lines 9-10).

13. With respect to claim 9, Winsor invention discloses that nickel adsorbent comprises nickel that is present on a support material (See page 2, lines 72-75).

14. With respect to claim 10, Winsor invention discloses using a fixed bed process (See page 2, lines 93-97; page 3, lines 1-5).

15. With respect to claims 11 and 12, Winsor invention does not specifically disclose nickel adsorbent further containing a metal oxide, however, the invention does disclose using cobalt and molybdenum oxides for sulfur removal in a step before desulfurization with nickel adsorbent. Winsor also discloses that more than one stage of desulfurization using nickel adsorbent can be used (See page 2, lines 30-41). Thus, it would have been obvious to one skilled in the art at the time the invention was made to modify Winsor invention and either use a metal oxide suitable for sulfur removal along with nickel in the adsorption process or use the metal oxide in a subsequent step to capture additional sulfur from hydrocarbon feed. It is further known to those skilled in the art that metal oxides upon reaction with sulfur compounds in the hydrocarbon produce corresponding sulfides. See *In re Burhans*, 154 F.2d 690, 69 USPQ 330 (CCPA 1946) (selection of any order of performing process steps is prima facie obvious in the absence of new or unexpected results); Also, see *In re Gibson*, 39 F.2d 975, 5 USPQ 230 (CCPA 1930).

**Conclusion**

16. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.


Terorde et al (US 2004/0091753 A1).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Prem C. Singh whose telephone number is 571-272-6381. The examiner can normally be reached on 8:00 AM to 4:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glenn Caldarola can be reached on 571-272-1444. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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Glenn Caldarola  
Supervisor, Patent Examiner  
Technology Center 1700